

and second hinge modules **300** and **400** must also stop its rotation at or about 45° intervals.

The second housing **102** is constructed so that the rotation of the second housing **102** is stopped at various angles according to the angle intervals where the valley-shaped portions **335** and **435** of the hinge cams **330** and **430** are respectively spaced from each other. For example, in case that the valley-shaped portions **335** and **435** are spaced from each other at or about 30° or 15° intervals, the second housing **102** stops its rotation at the corresponding location.

As apparent from the above description, the present invention provides a hinge device for a portable wireless terminal comprising a pair of housings respectively with rotary axes, thereby allowing one housing to be rotated from the other housing at or about 360°. Therefore, the portable wireless terminal employing the hinge device of the present invention accommodates various units such as a display device, an inputting unit, and so on, and the functions of the terminal are easily modified and extended in various ways. Further, various information terminals are easily integrated as one portable wireless terminal. Moreover, since a user can open or close the terminal at various angles according to circumferences, the portable wireless terminal of the present invention is conveniently used.

While the invention has been shown and described with reference to certain preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A hinge device of a portable wireless terminal with a first housing and a second housing being rotatably connected to the first housing, comprising:

a double hinge arm having a first hinge arm and second hinge arm extending in the longitudinal direction of the first and second housings, said first hinge arm being rotatably connected to the first housing and the second hinge arm being rotatably connected to the second housing;

a hinge hole formed in a first end of each of said first and second hinge arms of the double hinge arm;

at least one hinge module accommodated by each hinge hole so as to rotatably connect the respective hinge arm of the double hinge arm to the first and second housings, said at least one hinge module being rotatably fixed in the respective hinge hole with respect to the double hinge arm;

openings respectively formed on one side of each of the first and second housings so as to accommodate a respective hinge arm of the double hinge arm, each opening having a first end and a second end;

fixing holes respectively formed in said first ends of the first and second openings;

supporting holes respectively formed in second ends of the first and second hinge arms; and

hinge dummies respectively fixed to the fixing holes and inserted into the supporting holes of the first and second hinge arms so as to support the rotation of the double hinge arm.

2. The hinge device of a portable wireless terminal as set forth in claim 1, wherein the hinge module includes:

a hinge housing being accommodated by the hinge hole, and having a guide groove formed on the inner wall of its one side so as to extend in a longitudinal direction, and a through hole formed through its one end;

a hinge cam being accommodated by the hinge housing, and having a guide protrusion formed on its outer circumference so as to correspond to the guide groove and perform a rectilinear motion along the longitudinal direction within the hinge housing, and a plurality of valley-shaped portions formed on its one end;

a hinge shaft being accommodated by the hinge housing, and having at least two mountain-shaped portions formed on its one end so as to correspond to the valley-shaped portions of the hinge cam, and a hinge protrusion extending from its other end so as to be protruded to the outside via the through hole of the hinge housing, thereby rotating about a rotary axis extending in the longitudinal direction of the double hinge arm; and

a hinge spring interposed between the inner wall of the other end of the hinge housing and the hinge cam so as to supply an elastic force in a direction such that the valley-shaped portions of the hinge cam are closely engaged with the mountain-shaped portions of the hinge shaft.

3. The hinge device of a portable wireless terminal as set forth in claim 2, wherein in the case of at least one hinge module, the valley-shaped portions are spaced from each other by about 45° and the hinge shaft stops its rotation at about 45° intervals.

4. The hinge device of a portable wireless terminal as set forth in claim 2, wherein in one hinge module selected from the hinge modules, the valley-shaped portions are spaced from each other by about 90° and the hinge shaft stops its rotation at about 90° intervals.

5. The hinge device of claim 2, wherein each of said hinge shafts is rotatably fixed to a respective housing.

6. The hinge device of a portable wireless terminal as set forth in claim 1, wherein the double hinge arm is rotated respectively from the first and second housings in the range of about 180°.

7. The hinge device of a portable wireless terminal as set forth in claim 1, wherein the hinge modules are substantially parallelly installed on the double hinge arm.

8. The hinge device of claim 1, wherein each of said hinge modules include a hinge housing and a hinge shaft, said hinge shaft being rotatable with respect to said hinge housing and rotatably fixed to a respective housing.

9. A hinge device of a portable wireless terminal with a first housing and a second housing being rotatably connected to the first housing, comprising:

a double hinge arm including:

a first hinge arm extending in the longitudinal direction of the first housing and being rotatably connected to the first housing;

a second hinge arm being substantially parallelly connected to the first hinge arm, extending in the longitudinal direction of the second housing and being rotatably connected to the second housing; and

hinge holes respectively formed in a first end of each of the first and second hinge arms;

a first hinge module accommodated by the hinge hole of the first hinge arm so as to rotatably connect the double hinge arm to the first housing, said first hinge module being rotatably fixed with respect to said first hinge arm;

a second hinge module accommodated by the hinge hole of the second hinge arm so as to rotatably connect the double hinge arm to the second housing, said second hinge module being rotatably fixed with respect to said second hinge arm;